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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/645,132

08/21/2003

Fred P. Reinhard

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01/04/2011

BLAKELY SOKOLOFF TAYLOR & ZAFMAN LLP  
1279 OAKMEAD PARKWAY  
SUNNYVALE, CA 94085-4040

EXAMINER

WILKINS III, HARRY D

ART UNIT

PAPER NUMBER

1723

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/645,132	<b>Applicant(s)</b> REINHARD, FRED P.	
	<b>Examiner</b> Harry D. Wilkins, III	<b>Art Unit</b> 1723	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 16 November 2010.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-5,8-11,13-15,17 and 21-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5,8-11,13-15,17 and 21-26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 16 November 2010 has been entered.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1-5, 8-11, 13-15, 17, 21-26 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

a. (Claim 1) The recitations "the second cell frame further including a compartment to house a cathode electrode and a membrane" and "a first screen spacer interposed as an interface between the cathode electrode and the membrane" fail to be fully supported by the original specification.

In particular, the membrane of the present invention lies between the first cell frame and the second cell frame (see page 7, lines 4-11) and, thus, cannot be *in* either the first cell frame or the second cell frame and the spacer is interposed as an interface between the cell frames and the membrane, not between the electrodes and the membrane (see page 7, lines 4-11, page 14, lines 9-19 and page 17, lines 1-7).

b. (Claim 2) The recitation “a spacer interposed as an interface between the cathode electrode and the first membrane” fails to be fully supported by the original specification.

In particular, the spacer is interposed as an interface between the cell frames and the membrane, not between the electrodes and the membrane (see page 7, lines 4-11, page 14, lines 9-19 and page 17, lines 1-7).

c. (Claim 14) The recitation “a spacer interposed as an interface between the cathode electrode and the first membrane” fails to be fully supported by the original specification.

In particular, the spacer is interposed as an interface between the cell frames and the membrane, not between the electrodes and the membrane (see page 7, lines 4-11, page 14, lines 9-19 and page 17, lines 1-7).

d. (Claim 15) The recitation “a second spacer positioned between the anode electrode and the first membrane” fails to be fully supported by the original specification.

In particular, the spacer is interposed as an interface between the cell frames and the membrane, not between the electrodes and the membrane (see page 7, lines 4-11, page 14, lines 9-19 and page 17, lines 1-7).

e. (Claim 23) The recitations “a second cell frame comprises a compartment to house an anode electrode and a membrane” and “a first screen spacer interposed as an interface between the cathode electrode and the membrane” fail to be fully supported by the original specification.

In particular, the membrane of the present invention lies between the first cell frame and the second cell frame (see page 7, lines 4-11) and, thus, cannot be *in* either the first cell frame or the second cell frame and the spacer is interposed as an interface between the cell frames and the membrane, not between the electrodes and the membrane (see page 7, lines 4-11, page 14, lines 9-19 and page 17, lines 1-7).

f. (Claim 24) The recitation “a second screen spacer positioned between the cathode electrode and the membrane” fails to be fully supported by the original specification.

In particular, the spacer is interposed as an interface between the cell frames and the membrane, not between the electrodes and the membrane (see page 7, lines 4-11, page 14, lines 9-19 and page 17, lines 1-7).

#### ***Claim Interpretation***

4. In view of the 112, first paragraph rejections above, there appears to be a disconnect between what the application as filed discloses and what Applicant is now

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trying to claim. As such, the examiner must make assumptions regarding the claims to continue examination at this time until Applicant is able to take corrective action regarding the 112, first paragraph rejection. The examiner will assume that Applicant will amend the claims to be in line with the disclosure of the specification, namely that the membrane is located between the first and second cell frames and that the spacers provide an interface between the membrane and the first and second cell frames.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 2, 11, 23 and 24 are rejected under 35 U.S.C. 103(a) as being obvious over Tighe et al (US 4,129,493).

Tighe et al teach (see figure 2 and col. 4, lines 47-57) an electrolytic cell including a first cell frame (44) including a compartment to house an anode electrode (50); a second cell frame (34) including an in-flow port (78) and an out-flow port (80), the out-flow port positioned above the in-flow port, the second cell frame further including a compartment to house a cathode electrode (40); a membrane (64) positioned between the first and second cell frame (and thereby also between the anode and cathode). The cell also included first and second "screen" spacers (60, 62), otherwise known as gaskets, as an interface between the first and second cell frames

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and the membrane. The gaskets would inherently function to provide a defined distance between the membrane and the cathode.

Tighe et al teach the out-flow port (80) arranged along an outer perimeter of the second cell frame, but fails to teach the in-flow port (78) also arranged along an outer perimeter of the second cell frame.

However, Tighe et al teach (see col. 5, line 27-38) that the in-flow port should be arranged adjacent a lowermost portion of the catholyte chamber and that the out-flow port was also arranged adjacent an uppermost portion of the catholyte chamber.

Therefore, one of ordinary skill in the art would have been motivated to have rearranged the positioning of the in-flow port (78) to be at the outer perimeter similar to the out-flow port (80) to ensure that the in-flow port was arranged adjacent a lowermost portion of the catholyte chamber.

7. Claims 3, 4, 25 and 26 are rejected under 35 U.S.C. 103(a) as being obvious over Tighe et al (US 4,129,493) in view of Pohto et al (US 4,056,458).

Tighe et al teach forming the electrodes as screen electrodes that would inherently be "self-supporting". Tighe et al teach at least one connector for attachment to a bus bar passing through a back side of each cell frame for each of the anode and cathode.

Thus, Tighe et al fail to teach the connector passing through the top edge of the respective cell frame.

However, arrangements of electrolytic cells wherein the electrode connectors pass through the top edge of the cell frames instead of the back side. For example see

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Pohto et al (US 4,056,458). The arrangement of the electrode connectors at the top edge of the cell frames permits multiple cell frames to be positioned more closely together.

Therefore, it would have been obvious to one of ordinary skill in the art to have rearranged the electrode connectors to pass through the top edge of the cell frames instead of the back side to permit multiple adjacent cells to be positioned more closely to one another.

8. Claims 5 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tighe et al (US 4,129,493) in view of Pohto et al (US 4,056,458) as applied to claims 3 and 4 above, and further in view of "Newest News About Brown's Gas".

Tighe et al do not teach a sidewall or endwall of the second cell frame being transparent or translucent.

One of ordinary skill in the art would have found it obvious to have made any of the sidewall and endwall of a cell frame or a clamping frame to be transparent in order that the indicators of a reaction (such as formation of gas bubbles) might be viewed by the operator.

Evidence that such modification was known to one of ordinary skill in the art of electrolyzers can be seen in "Newest News About Brown's Gas". On the first page is described and pictured, an electrolyzer made from a transparent housing so that internal formation of bubbles could be visually detected while the electrolyzer was being operated. Thus, the Examiner has shown that it was well within the knowledge of one of ordinary skill in the art to make portions of an electrolyzer transparent for the purpose



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of allowing visual inspection of reaction progression, particularly for noticing the formation of gas bubbles.

9. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being obvious over Tighe et al (US 4,129,493) in view of Weltin et al (US 3,875,040).

Tighe et al teach assembly of a single cell.

However, it was known in the prior art to assemble multiple cells together to increase production capacity. See for example Weltin et al.

Weltin et al also teach a manner in which multiple cells are held together and elastic gaskets clamping membranes between adjacent cells. The assembly included first and second end plates 16 (i.e.-first and second clamping frames) on either end of the stack of cells, a plurality of bolts 9 (i.e.-fastening rods) inserted through apertures of the end plates and a plurality of nuts 17 (i.e.-fastening components) each positioned on a corresponding end of one of the bolts.

Therefore, it would have been obvious to one of ordinary skill in the art to have utilized the end frames, bolts and nuts of Weltin et al when assembling a stack of multiple electrolytic cells of Tighe et al to provide for clamping and compression of all of the cells and sealing gaskets in each of the individual cells.

10. Claim 10 is are rejected under 35 U.S.C. 103(a) as being obvious over Tighe et al (US 4,129,493) in view of Weltin et al (US 3,875,040) as applied above to claim 8, and further in view of "Newest News About Brown's Gas".

Neither Tighe et al nor Weltin et al teach the clamping frames including a centrally located opening to permit viewing of at least one side of the second cell frame, which is transparent or translucent.

One of ordinary skill in the art would have found it obvious to have made any of the sidewall of a cell frame to be transparent in order that the indicators of a reaction (such as formation of gas bubbles) might be viewed by the operator.

Evidence that such modification was known to one of ordinary skill in the art of electrolyzers can be seen in "Newest News About Brown's Gas". On the first page is described and pictured, an electrolyzer made from a transparent housing so that internal formation of bubbles could be visually detected while the electrolyzer was being operated. Thus, the Examiner has shown that it was well within the knowledge of one of ordinary skill in the art to make portions of an electrolyzer transparent for the purpose of allowing visual inspection of reaction progression, particularly for noticing the formation of gas bubbles.

Since the clamping frame of Weltin et al covers the sidewall of the second cell frame, in order to permit viewing inside the cell, the clamping frame necessarily would have included either a transparent section or an opening over the location corresponding to the transparent portion of the cell frame.

11. Claims 14, 15, 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tighe et al (US 4,129,493) in view of "Newest News About Brown's Gas".

As above, Tighe et al teach a first cell frame including a first compartment to house an anode electrode, a second cell frame including a second compartment to

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house a cathode electrode, and wherein a first membrane is positioned between the first and second cell frames and spacers (gaskets) are interposed as an interface between the membrane and the cell frames.

Thus, Tighe et al fail to teach that a sidewall of the first cell frame was transparent or translucent.

One of ordinary skill in the art would have found it obvious to have made any of the sidewall and endwall of a cell frame to be transparent in order that the indicators of a reaction (such as formation of gas bubbles) might be viewed by the operator.

Evidence that such modification was known to one of ordinary skill in the art of electrolyzers can be seen in "Newest News About Brown's Gas". On the first page is described and pictured, an electrolyzer made from a transparent housing so that internal formation of bubbles could be visually detected while the electrolyzer was being operated. Thus, the Examiner has shown that it was well within the knowledge of one of ordinary skill in the art to make portions of an electrolyzer transparent for the purpose of allowing visual inspection of reaction progression, particularly for noticing the formation of gas bubbles.

12. Claims 21 and 22 are rejected under 35 U.S.C. 103(a) as being obvious over Tighe et al (US 4,129,493) in view of "Newest News About Brown's Gas" as applied above to claim 14, and further in view of Pohto et al (US 4,056,458).

Tighe et al teach forming the electrodes as screen electrodes that would inherently be "self-supporting". Tighe et al teach at least one connector for attachment

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to a bus bar passing through a back side of each cell frame for each of the anode and cathode.

Thus, Tighe et al fail to teach the connector passing through the top edge of the respective cell frame.

However, arrangements of electrolytic cells wherein the electrode connectors pass through the top edge of the cell frames instead of the back side. For example see Pohto et al (US 4,056,458). The arrangement of the electrode connectors at the top edge of the cell frames permits multiple cell frames to be positioned more closely together.

Therefore, it would have been obvious to one of ordinary skill in the art to have rearranged the electrode connectors to pass through the top edge of the cell frames instead of the back side to permit multiple adjacent cells to be positioned more closely to one another.

### ***Response to Arguments***

13. Applicant's arguments with respect to claims 1-5, 8-11, 13-15, 17 and 21-26 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Harry D. Wilkins, III whose telephone number is 571-272-1251. The examiner can normally be reached on M-F 9:00am-5:30pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on 571-272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Harry D Wilkins, III/  
Primary Examiner, Art Unit 1723

hdw